

STATUS, DISTRIBUTION AND GENERAL ECOLOGY OF THE INDIAN PYTHON
PYTHON MOLURUS MOLURUS LINN. IN KEOLADEO NATIONAL PARK,
BHARATPUR, RAJASTHAN,¹

S. BHUPATHY AND V.S. VIJAYAN²
(With a plate and two text-figures)

INTRODUCTION

The Indian subcontinent has two species of python (Family: Boidae), namely Reticulated Python *Python reticulatus* and Rock Python *P. molurus*. The latter has two races: *P.m. molurus* and *P.m. bivittatus*, which are popularly known as the Indian and the Burmese python respectively. The Indian Python is recorded in, Pakistan, Nepal, Bangladesh and Sri Lanka, apart from India. Probably because of the deep-rooted superstitions about snakes and their cryptic nature, most of them have not been studied in detail in the subcontinent. The Indian Python is no exception. Reliable information on the population, habitat and ecology of this giant snake is not available, although notes on its distribution, food and general biology are available (Smith 1943, Pope 1962, Minton and Minton 1973, Sharma and Sharma 1977, Whitaker 1978, Daniel 1983). However, a considerable amount of work has been carried out in captivity on its breeding (Acharjyo and Misra 1976, Van Mierop and Bernard 1978, Dattatri 1983), growth rate (Acharjyo and Misra 1980) and parasites (Pope 1962, Frank and Haefner 1981, Ismail 1984). The present paper deals with the population, distribution and habitats, cohabiting animals, predation, ectoparasites, breeding season, hibernation, and aestivation of the Indian Python.

The study was conducted in the Keoladeo National Park, Bharatpur (27° 7.6' to 27° 12.2' N and 77° 29.5' to 77° 33.9' E), situated 50 km we-

st of Agra. The total area of the park is 29 sq. km, of which 8.5 sq. km is aquatic. Terrestrial vegetation is closer to the Babul Forest described by Champion and Seth (1968) under the northern dry mixed deciduous forest. A detailed account of the physical environs, flora and fauna of the Park is given by Ali and Vijayan (1983, 1986) and Vijayan (1987).

METHODOLOGY

A complete survey was made on foot and the locations where pythons and their signs were noticed were marked on a map. The holes where pythons were seen regularly are referred to as "python points" in this study. An estimation of their population was made by checking these points repeatedly and counting the number of snakes, especially in winter when the python comes out for basking. Censuses were conducted between 0900 hrs and 1600 hrs. Approximate length of each snake, and wounds and ticks, if any, on each individual were recorded. A python between 80-120 cm in length was considered to be a young one. The maximum number of snakes recorded at a python point was taken as the population of that particular point; the total population was obtained by summing up figures obtained from each point. The method, however, has the following limitations:

- 1) hibernating or partially hibernating individuals in the area, if any, may escape counting,
- 2) foraging pythons or those which are away from the points may be overlooked,
- 3) young pythons are difficult to locate as they merge well with the surroundings,
- 4) movement of pythons from one point to the other may lead to overlap in counting. To over-

¹Accepted October 1988.

²Bombay Natural History Society Ecological Research Centre, Bharatpur, Rajasthan, India-321 001.

come this last difficulty points close to each other were covered in succession.

The composition of vegetation and the cover offered by it within a 10 m radius of 39 python points was studied thoroughly. The comparative thickness of cover offered by each species of plant was ranked from 0-10. Signs of other animals in and around the python points were recorded and night observations were made to confirm the movement of animals in and out of python holes. The study was conducted between November 1985 and May 1987.

RESULTS AND DISCUSSION

Populations: The maximum number of pythons recorded in the Park during the winters of 1985-86 and 1986-87 was 144 and 111 respectively (Table 1). However, 10 snakes were found dead during the former winter; the population in that period would therefore be 134. Similarly, five snakes were found dead during the winter of 1986-87

and, two python points with six pythons were found totally destroyed. These points appeared to have been dug out by people, and the fate of those six snakes was uncertain. Altogether, 21 snakes disappeared within two years.

The maximum number of snakes seen in the surveys covering the adjacent points and blocks at a stretch was 78 (Table 2). The exact number of snakes added to the population was not known. Freshly hatched egg-shells were seen in July-August 1986.

Mortality: Trampling by ungulates and unsuccessful attacks on porcupines may be some of the reasons for the mortality among pythons. Of 15 dead snakes recorded, 8 had hoof marks, and 2 had several small holes, presumably left by porcupine quills. Both hoof and quill marks were also seen on live snakes.

Distribution: Altogether, 46 python points were identified inside the Park, 41 on land and 5 in water (Fig. 1). The distribution of python points

TABLE 1
POPULATION OF PYTHONS IN EACH BLOCK DURING THE WINTERS OF 1985-86
AND 1986-87

Block	No. of python points	Total No. of python seen	
		1985-86	1986-87
A	5	9	11
B	5	16	15
C	2	15	13
F	4	13	20
G	1	4	3
H*	4	7	2
I	5	30	15
J	1	-	-
K	3	8	14
M*	4	19	6
N	1	1	-
O	6	15	6
Aquatic area	5	7	6
Total	46	144	111

*One point dug out in each during early 1987 (anthropogenic disturbance).

TABLE 2
TOTAL NUMBER OF PYTHONS SEEN IN EACH BLOCK DURING 1986-87 WINTER

Trial	Block	No. of points	Number of snakes seen	
			Sum of the maximum of each point	Counted from adjacent points at a stretch
I	A	5	11	7
	B	5	15	8
	O	6	6	3
	C	2	13	11
II	F	4	20	16
	I	5	15	10
III	G	1	3	3
	H	4	2	2
IV	K	3	14	8
V	M	4	6	5
VI	Aquatic area	5	6	5
Total		44	111	78

TABLE 3
NUMBER OF PYTHON POINTS OCCURRING AT VARIOUS DEGREES OF VEGETATION COVER

Plant species	Percentage cover										Total No. of pythons points
	10	20	30	40	50	60	70	80	90	100	
<i>Salvadora persica</i>	0	0	1	0	4	3	3	9	7	2	29
<i>S. oleoides</i>	3	0	0	1	4	1	2	1	1	0	13
<i>Prosopis juliflora</i>	8	7	1	2	0	0	0	0	0	0	18
<i>Acacia nilotica</i>	6	0	0	0	0	0	0	0	0	0	6
<i>Capparis sepiaria</i>	15	1	1	3	2	0	0	1	1	0	24
Others	5	0	1	1	0	0	0	0	0	0	7

Note: The total number of points studied was 39.

on land was dependent mainly upon the availability of either fresh or abandoned porcupine burrows and saline patches. But in marshy areas they preferred hollow trees and termite mounds. More points were recorded in blocks F

and I (9), O (6) and B (5).

The maximum number of snakes seen at one time at a particular point was 12. More than 5 snakes (Plate 1) were seen at 10 different points in both years. Block I had the maximum number

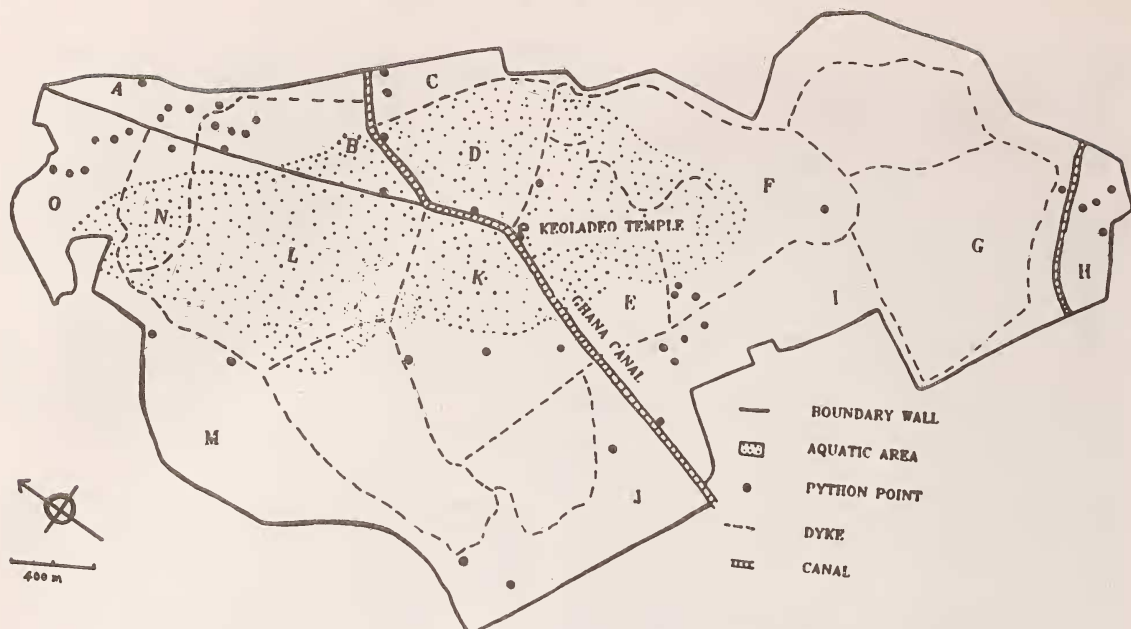


Fig. 1. Distribution of python points in Keoladeo National Park.

of snakes (30), during 1985-86 and F (20) during 1986-87 winter (Fig. 1).

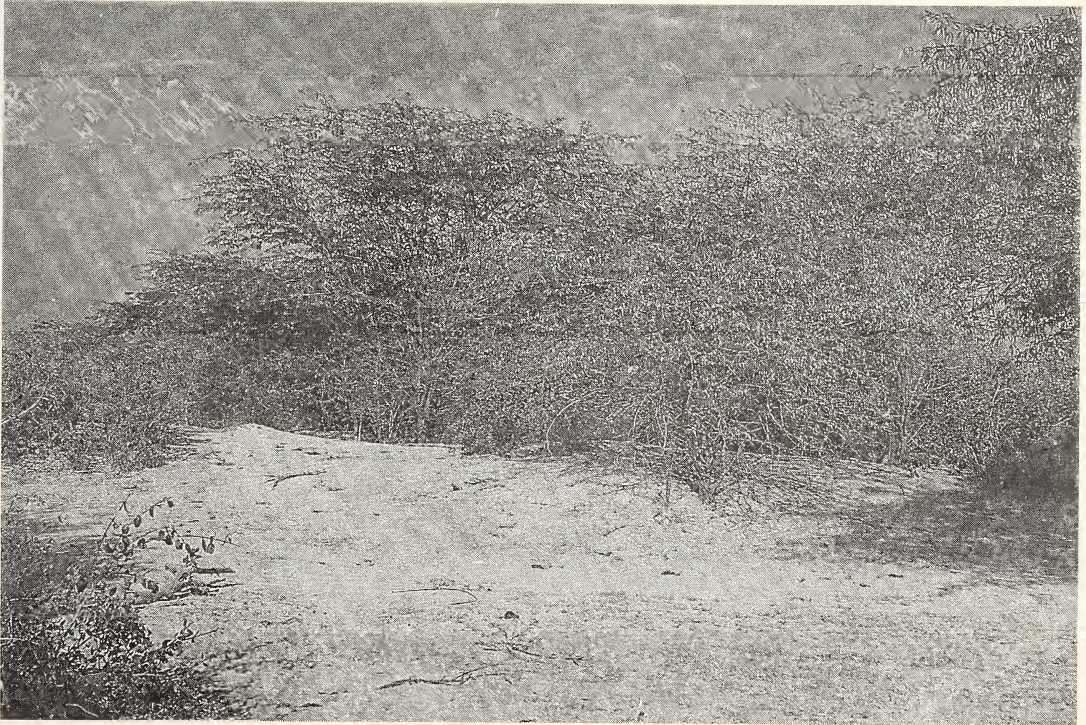
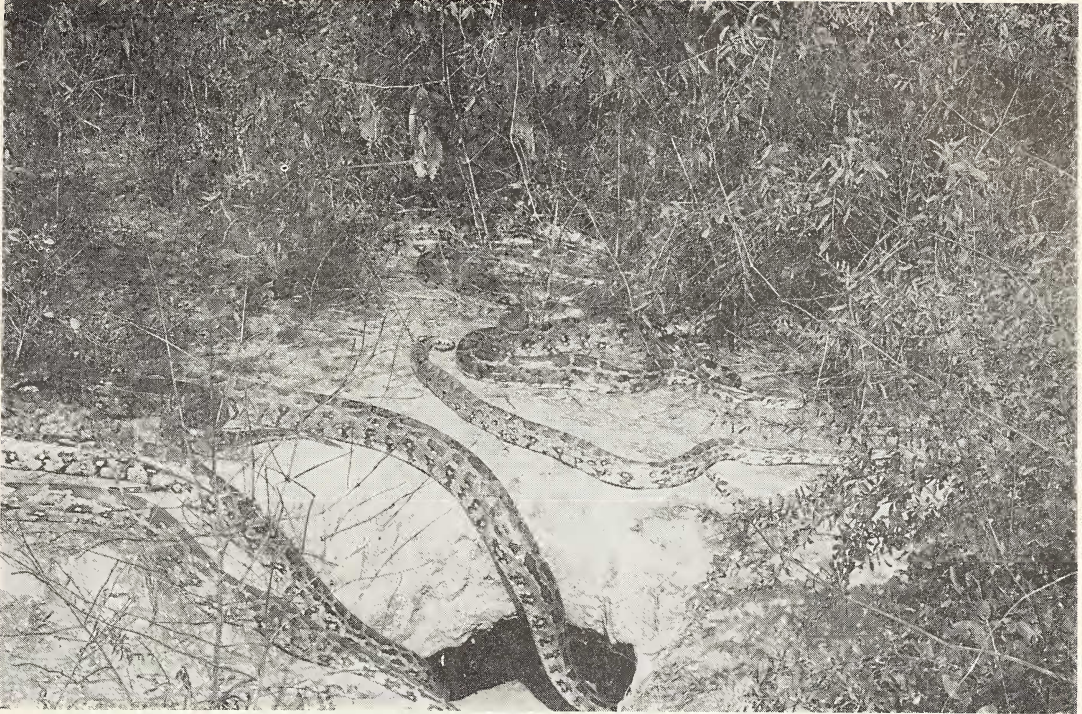
Habitat: Pythons usually preferred saline patches where porcupine burrows were common. Most of the burrows (83%) were situated at slightly elevated areas. The apparent advantages of the selection of such sites are: 1) the soil is comparatively loose in these areas, making it easy for the porcupine to dig, 2) elevation of the site ensures the hole against inundation during the monsoon.

Vegetation in python habitats: Vegetation in the python point areas consists mainly of *Salvadora persica*, *S. oleoides*, *Capparis sepiaria*, *Prosopis juliflora* and *Acacia nilotica*. Of these, *S. persica* was the most common, followed by *C. sepiaria* (Table 3). In all but two cases, either of the *Salvadora* spp. was noticed. Pythons were seldom seen in woodlands of *Mitragyna parvifolia* and open grasslands, the latter dominated by *Vetiveria zizanioides* and *Desmostachia bipinnata*. No permanent points were recorded from these habitats. **Vegetation cover over the python points:** The maximum cover was provided by the *Salvadora* spp. In the 39 python points studied, *S. persica* was seen in 29, and offered more than 50% of cover in 28 points. Although species such as *P.*

juliflora and *C. sepiaria* were seen in many points, the cover offered by them was very low (Fig. 2).

When the foliage cover of all 39 points was considered together, it was found that 55.6% of the total cover was formed by *Salvadora persica*, 16.4% by *S. oleoides*, 8.5% by *P. juliflora*, 15.1% by *Capparis sepiaria*, 1.5% by *Acacia nilotica* and the rest by others (Fig. 2). The high preference for *Salvadora* spp. may be because of its dense foliage, which might help in cooling the burrows during the hot summer.

Food: Birds and mammals were the main food of the pythons in this Park, as has been reported elsewhere (Smith 1943, Minton and Minton 1973, Whitaker 1978, Daniel 1983). The following prey have been recorded from the Park: Spotbill Duck *Anas poecilorhyncha* (Sridharan and Ram Manohar 1984), Purple Moorhen *Porphyrio porphyrio* (Lalitha Vijayan and Prasad, pers. comm.), Coucal *Centropus sinensis* (Dubey 1985), Cotton Teal *Nettapus coromandelianus*, Grey Partridge *Francolinus pondicerianus*, and Redstart *Phoenicurus ochruros*; Five-striped Palm Squirrel *Funambulus pennanti*, Rufoustailed Hare *Lepus nigricollis*, and Chital *Cervus axis*. A python with porcupine quills protruding from its



Above : Pythons basking near their hole. *Salvadora persica*, the main cover species, is also seen.
Below : Typical habitat in study area.

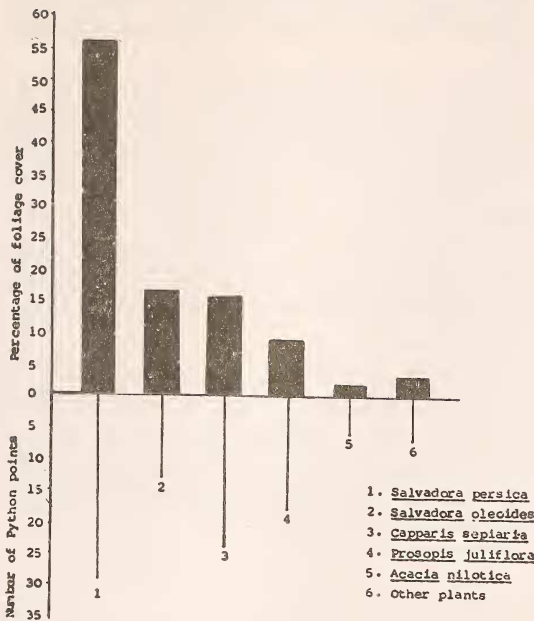


Fig. 2. Frequency of python points under each plant species and average foliage cover.

body has been observed by Rajan Mathur (pers. comm.).

Co-existing species: The Indian Porcupine *Hystrix indica* and Bicoloured Leaf-nosed Bat *Hipposideorus fulvus* were seen in the same burrow with pythons (Bhupathy and Haque 1986). During the period of this study, the Whitebreasted Kingfisher *Halocyon smyrnensis* was seen nesting successfully at the entrance of python holes.

All the python points, except those in the aquatic area, were either fresh or abandoned burrows of porcupine; quills, droppings and spoors of porcupine were present in the excavated soil. Porcupines were sighted in these holes at night. The Bicoloured Leaf-nosed Bats were seen in 21 points (51.1%) along with python and porcupine. The Whitebreasted Kingfisher nested successfully during May-September 1986 at three different points. A jackal *Canis aureus* entered a python hole thrice in January 1986, possibly as a part of

den-selection for parturition. Besides this, tracks and droppings of the Striped Hyena *Hyena hyena* were seen regularly at the entrance of several python holes. Whether the hyena was preying on the python was not certain, although the phenomenon has been reported from Africa (Minton and Minton 1973).

It is interesting to note that porcupines, which at times become the prey of pythons, share the same hole with them. This may be because the hole is too cramped for the python to catch, constrict and swallow the prey.

Predation: It is not certain whether there is any true predator to an adult python. However, jackals in a pack of three individuals were observed attacking a python. Further, python scales were recorded in the droppings of jackal once during this study. Whether jackals feed on live snakes or scavenge is not clear. On the other hand, jackals have been recorded as a food of the python (Whitaker 1978, Daniel 1983, Singh 1983). Common Monitor *Varanus bengalensis* was observed pilfering eggs from a python hole which had both hatched and unhatched eggs. Larger eagles such as *Aquila* spp. visit the Park every year during the winter and the possibility of their preying on the young pythons cannot be ruled out.

Ectoparasites: Four genera of ticks, namely *Aponomma* sp., *Amblyomma* sp., *Hyalomma* sp. and *Haemophysallis* sp. have been recorded during the study. The first two have been reported earlier from captive pythons (Pope 1962, Ismail 1984).

Breeding season: The breeding season of the python inside the Park starts from the middle of February and extends upto the beginning of August. Frequency of mating and interhole movement was higher between February and March. Freshly-hatched egg-shells and young were seen in end July. In the Indus valley the season is almost the same (Minton and Minton 1973). Mating of pythons has also been recorded during December to March (Smith 1943, Daniel 1983). In captivity it has been reported from February to early April (Dattatri *in press*).

Hibernation and aestivation: Although pythons